Precipitation.—Greatest monthly, 3.88, at Yorkville; least monthly, 0.60, at Saint Matthews

Wind.—Prevailing direction, southwest.—A. P. Butler, Observer, Weather Bureau, Columbia, director.

#### SOUTH DAKOTA.

Temperature.—The mean was 2.3 below the normal; maximum, 80, at Millbank, 5th; minimum, -20, at Ashcroft, 25th; greatest monthly range, 96, at Asheroft; least monthly range, 60, at Millbank.

Precipitation.—The average was 0.02 above the normal; greatest monthly,

2.34, at Webster; least monthly, trace, at Piedmont.

Wind .- Prevailing direction, northwest .- S. W. Glenn, Local Forecast Official, Weather Bureau, Huron, director.

#### TENNESSEE WEATHER AND CROP SERVICE.

Temperature.-The mean was 1.0 below the normal of the last 10 years; maximum, 79, at Riddleton, 13th, and at Sweetwater, 12th and 19th; minimum, 11, at Johnson City, 25th; greatest monthly range, 66, at Riddleton and Sweetwater; least monthly range, 42, at Florence Station.

Precipitation.—The average was 1.37 above the normal of the last 10 years; greatest monthly, 7.55, at Covington; least monthly, 2.70, at Bolivar.

Wind.—Prevailing direction, north.—J. B. Marbury, Local Forecast Official, Weather Bureau, Nashville, director.

### TEXAS

Temperature. - The mean was 1.2 above the normal; maximum, 94, at Fort Ringgold, 3d; minimum, 18, at Fort Hancock, 18th; greatest monthly range, 64, at Fort Ringgold and Weatherford; least monthly range, 36, at Galveston.

Precipitation.—The average was 0.15 above the normal; greatest monthly,

7.22, at Huntsville: least monthly, trace, at Childress.

Wind.—Prevailing direction, south.—D. D. Bryan, Galveston, director;
I. M. Cline, Local Forecast Official, Weather Bureau, assistant.

Temperature.—Maximum, 76, at Fillmore, 12th; minimum, -6, at Loa, 24th; greatest monthly range, 67, at Fillmore; least monthly range, 41, at Grouse Creek.

Precipitation.—Greatest monthly, 0.72, at Salt Lake City; least monthly, 0.00, at Losee and Green River.—G. N. Salisbury, Observer, Weather Bureau, Salt Lake City, director.

### VIRGINIA.

Temperature. - Maximum, 79, at Richmond, 8th, and at Salem, 4th; minimum, 10, at Big Stone Gap, 24th, and at Hot Springs and Marion, 25th; Weather Bureau, Cheyenne, director.

greatest monthly range, 63, at Richmond; least monthly range, 42, at Moss-

Precipitation.—Greatest monthly, 6.15, at Big Stone Gap; least monthly, 1.62, at Falls Church.

Wind.—Prevailing direction, northwest.—Dr. E. A. Craighill, Lynch-burg, director; J. N. Ryker, Observer, Weather Bureau, assistant.

#### WASHINGTON.

Temperature. - Maximum, 70, at Tacoma and Walla Walla, 3d; minimum, 8, at Waterville, 26th; greatest monthly range, 50, at Rosalia; least monthly range, 21, at Tatoosh Island and Vashon.

Precipitation.—Greatest monthly, 20.62, at Neah Bay; least monthly, 0.71,

at Moxee.

Wind.—Prevailing direction, south.—H. F. Alciatore, Observer, Weather Bureau, Olympia, director.

#### WEST VIRGINIA.

Temperature. - Maximum, 81, at New Cumberland, 17th; minimum, 3, at Buckhannon, 24th; greatest monthly range, 76, at Spencer; least monthly range, 46, at Danville and Romney.

Precipitation.—Greatest monthly, 4.94, at Rowlesburg; least monthly, 1.58,

at Bluefield.

Wind.—Prevailing direction, southwest.—W. W. Dent, Observer, Weather Bureau, Parkersburg, director.

#### WISCONSIN.

Temperature.—The mean was 4.0 below the normal; maximum, 65, at Port Washington, 13th; minimum, —1, at Barron, Butternut, Hillsboro, and Osceola Mills, 24th, at Grantsburg, 23d, and at Rhinelander, 19th; greatest monthly range, 58, at Barron; least monthly range, 30, at Cadiz.

Precipitation.—Greatest monthly, 2.93, at Green Bay; least monthly, 0.37, at Shell Lake.

Wind .- Prevailing direction, northwest .- W. L. Moore, Local Forecast Official, Weather Bureau, Milwaukee, director.

Temperature.—Maximum, 72, at Fort McKinney, 4th; minimum, -5, at Camp Pilot Butte, 7th; greatest monthly range, 70, at Fort McKinney; least monthly range, 43, at Fort Yellowstone.

Precipitation. - Greatest monthly, 1.90, at Fort Yellowstone; least monthly,

trace, at Laramie.

Wind .- Prevailing direction, southwest .- E. M. Ravenscraft, Observer,

# CONTRIBUTIONS AND O'RIGINAL ARTICLES.

TORNADO AT EAGLES MERE, PA., JUNE 27, 1892.

The following is the substance of a report by Mr. H. L. Ball, Observer, Weather Bureau, and Assistant Director of the Pennsylvania Weather Service, on a tornado which passed near Eagles Mere, Sullivan Co., Pa., June 27, 1892:

Eagles Mere is a small village situated on the table land of northern Pennsylvania, at an elevation of more than 2,000 feet. It is surrounded by forests and the country is broken by short hills and broad valleys.

June 27th was warm and rainy. About 4.30 p. m. clouds were observed moving rapidly from the northwest and northeast towards the south and southwest, where they presented an exceedingly dark and angry appearance. About 5 p. m. the tornado appeared in the form of an immense funnel-shaped cloud moving from southwest to northeast. It was attended by a loud roaring noise, and everything in a path one-half mile to one mile in width and ten to fifteen miles in length was leveled. In the forest the path was clearly cut; immense trees were uprooted and thrown in all directions, and a whirling motion was plainly shown. Although the path of the storm was two to three hundred yards east of the village a number of houses were within its influence. One house was completely demolished, others were moved, and one house was turned around without being seriously damaged. Water from a lake was carried up in a sheet, and a large stone was hurled into a house. After passing the village the tornado struck the side of a heavily wooded hill about 100 feet in height. Every tree was uprooted, those on the left of the center of the path pointing down, and those on the right pointing up the hill. about 100 feet in height. The path of the tornado was through the forest, except where it struck the edge of Eagles Mere, and no lives were lost.

THE GALVESTON ISLAND (TEX.) TORNADO, NOVEMBER 6, 1892.

Mr. M. Wright, Assistant Observer, Weather Bureau, temporarily in charge of the station at Galveston, Tex., furnishes an interesting description of a tornado that visited Galveston Island the morning of November 6, 1892:

The tornado first appeared about 11 miles below Galveston, at 5.45 a. m., and traveled in a northeasterly direction about 8 miles. The country over

which the storm passed was level and generally uncultivated. During the passage of the tornado a severe thunder and rain storm prevailed over the sland; further notes relative to the conditions which obtained are lack-The path of the tornado varied from 50 to 125 feet in width; the greatest destructive force was manifested on the south side of the path, and the time required for the storm to pass a given point was estimated at 30 seconds.

The destructive force of the tornado was first felt about 2 miles southwest of what is known as the "9-mile school house." At that point an old building had been crushed downward, apparently by a force exerted from above, the north and east sides of the building being thrown outward and the south and west sides inward. Parts of the roof were thrown in all directions, and a number of boards were carried about 50 feet northeastward; at that place the path of destruction was about 50 feet in width. From the old building to the school house the path was indistinct; in two places, one about 1,500 feet from the old building and the other about 500 feet southwest of the school house, the mesquite brush was twisted and blown to the ground, showing a whirling, right to left movement.

The school house, which was totally destroyed, was set on blocks and was blown from its foundation, the débris being scattered to the northeastward; at this point the width of the path of destruction was about 60 feet.

The storm then moved northeast about 2 miles over a tract of country without encountering houses or trees, the path varying from 50 to 75 feet in width; mesquite brush was leveled, and in some places it was twisted off and carried northeastward some 300 feet. A barn was next unroofed and the roof carried about 130 feet east-northeast; the remainder of the barn was left standing but was badly wrecked. A house which stood 75 feet south and 100 feet east of the barn was moved from its foundation and turned to the northward about 40°. It was calculated that the storm-center passed about 50 feet north of the barn.

The tornado passed thence through an orchard in an easterly direction; some of the trees were blown down and twisted until they were a mass of splinters at the base, none being uprooted or broken entirely off. In the center of the path the trees were thrown east 15° to 20° north, and those on the south side were lying east 30° to 40° north. Trees in the extreme southern part of the orchard were apparently broken by a force exerted downward; branches were broken, and bark was torn from the trees from the branches

nearly to the ground. The path of destruction at that point was about 125 seemingly a great number of times without losing consciousness, and was set down on the east side of the former site of the house. The boards of the

The tornado then moved east about 10° north two and one-half miles over pasture lands. The next building destroyed was a cottage, which was torn to pieces; a barn was wrecked; and an orange grove nearly destroyed. The cottage stood 150 feet west 30° north of the barn, and the débris was thrown directly east. In the orchard trees were torn up by the roots or broken and twisted in the storm's path. The roof of the barn was carried into the orchard, the barn was torn down, and the débris thrown eastward some 100 yards. A two-story residence 150 feet southeast of the barn was uninjured, although an oak tree fully 3 feet in diameter which stood 9 feet west of the building was torn up by the roots and thrown against the west side of the house. The path at that point was about 100 feet in width.

Moving eastward about 300 yards the tornado demolished another cottage and carried timbers, etc., east by north a distance of 1,200 feet. A barn 60 feet north of the cottage was also demolished. A pen, containing 7 calves, about 30 feet west and 15 feet north of the cottage was blown down. Three of the calves were carried eastward and killed, 2 about 150 yards, and the other 300 yards. One of the inmates of the cottage stated that he was dressing when the storm struck. The first noticeable feature was a noise resembling the discharge of musketry. Before he could realize the nature of the noise he saw the end of the house falling. He was then picked up and whirled around

seemingly a great number of times without losing consciousness, and was set down on the east side of the former site of the house. The boards of the house were observed flying eastward and had the motion of loose straw in a whirlwind. Heavy rain and thunder were also noticed. The width of the path of destruction at that place was about 75 feet.

path of destruction at that place was about 75 feet.

Moving one-half mile northeast, prostrating wire fences in its passage, the storm struck a barn. The east end of the barn had a driveway through the center, running north and south. This end of the barn was blown out and the roof settled to the ground. Thirty feet north of the barn a small stack of oats was undisturbed. Three buildings used as dwellings were next reached. One, a small building south of the barn, was moved about two feet without being seriously injured; about 100 feet east of the small building stood two larger buildings close together. The two buildings were completely demolished. The more westward of the two buildings was thrown toward the south, and the débris was scattered about 50 feet. The other house, where one child was killed, was thrown to the northeastward. Eight other persons in the house escaped without serious injury. The path of destruction at that point was about 75 feet. Moving northeast about one-half mile the storm unroofed a barn and moved a house from its foundation. The path narrowed to 50 feet.

During the remainder of its course the tornado apparently diminished in intensity.

## METEOROLOGICAL TABLES.

Meteorological record of Army post surgeons, voluntary, and other co-operating observers, November, 1892.

	Temperature. (Fahrenheit.)			n,d	_	Ter (Fa	nperat hrenh	,'n.	
Stations.	Max.	Min.	Mean.	Precip'n.	Stations.	Max.	Mib.	Mean	Precip'n.
Alabama.	0	0		Ins.	Arizona-Cont'd.	۰	0	•	Ins.
Alco	82	29	56.9		Gila Bend a * † 1	76	42	61.6	0.0
Bermuda * † 5 Brewton †	79	29	55.2	0.17	: Gua bena 0**	90	44	65.8	0.0
Citronelle†	85	28 37	56.0 58.8	1.65 2.31	Holbrook † Maricopa *1	85	40	65.7	0. I
Claiborne Landing †	79	3/	50.0	1.00	Mount Huachuca t.		34	53.0	0.0
Cordova t				5.74	Natural Bridge t				0.1
Cordova† Daphne† Decatura†	8o	33	58.4	2.55	Navajo Springs † New River † Nogales * † 5 Oracle † 1				0.5
Decatura†	· • • • •			5.60	New River †	84	35	61.4	0.0
Decatur b †		18	47.2	5.28	Nogales * † 5	79	35	58.2	0.0
Eufaula a † Evergreen † Florence a †	79	30	55.4	1.19	Oracle 7 1	71	36	52.6	T.
Plorence at	81	30	56.6	3·25 5·37	Pantano *1	83	E,	64.8	0.0
Fort Deposit†	79	27	54.2	2.02	Payson *1	70	51 27	42.0	0.0
ladsden t			34.2	7.91	Peoria †	80	34	59.9	0.0
Geneva† Greensboro†	84	34	57 - 3	2.79	Pantano*1 Payson*1 Peoria† Phenix a †	89	26	62.2	0.0
Greensboro t	79	30	52.3	3.00	Luca Rock **	ו 75	43	61.4	0.0
Healing Springs† Highland Home†	89	23	55.0	2.72	San Carlos San Simon • 1	78	25	51.8	0.3
Highland Home †	78	31	55.3	2.29	San Simon • 1	So	43	58.3	0.0
Livingston a † 1	88	30	52.7	2.69	Show Low Signal †	82	26	-6 -	0.4 T.
Lock No 4*	79	27°	54·2°	3.25 3.72	Teviston	32	20	56.5	T.
Livingstono† Lock No. 4 * Lynn†		42		4.82	Texas Hill *1	85	34	61.9	0.0
Marion†	75	29	54.4	2.73	Teviston. Texas Hill*1 Tucson a† Tucson b*1 Walnut Banch *+1	80	37	58.8	0.0
Marion† Maysville†	79	33	56.3	5.73	Tucson b * 1	So	40	61.0	0.0
Mount Willing †	78	32	58· i	5.05	waing banen - [	00	30	48.7	0.1
Newberg †	76	23	51.3	3.93	Whipple Barracks.	74	13	45.6	0.0
Opelika† Oxanna•†¹ Pine Apple†	78	29	54 • 4	3 37	Wilgus †		'		0.2
Ding Apple t	73	26	50.2	4.50 2.68	Winelow # + 5	85	42	58.7	0.0
Pughmataha t	SI	27	54·2 54·0	2.05 2.QI	Willcox *1 Winslow * † 5 Yuma *1	71 90	12 48	72.2	о. г Т.
Pushmataha† Scottsboro†	75 74	23	49.3	7.83	Arkansas.	90	40	12.2	1.
Belma a t				4.05	Arkadelphia†				8.5
Sturdevant † Palladega † Pallassee Falls †				4.95					3.1
l'alladega †				4-94	Bee Branch †	75	23	48.6	2.8
l'allassee Fails 7				5-44	Black Rock * † 1	67	22	48.4	4.4
Thomasville †	84	28	53. I	3.00	Consider at	72	29	49.8	8.4
Fuscaloosa † Fuscumbia b†	76	24	50.2	5.95	Camden h † 1	78	28		9.2
Union Springs a t	Sr.	28	53.3	3.55	Arkansas City T. Bee Branch † Black Rock * † 1 Brinkley † Camden a † Camden b † 1 Conway * 1 Dallas † 1 Dardanelle † Eldorado †	70	26	53·4 49·1	4.0
Uniontown	77	32	54.0	3.02	Dallas † 1	72	30	50.3	4.7
Valley Head †1	73	20	45.7	8.48	Dardanelle†				3.1
Uniontown Valley Head † 1 Warrior †				5-13	Eldorado † Fayetteville † 1 Forrest †	79	32	55.8	5.3
wetumpka *		24		4.68	Fayetteville 71	68	26	46.0	2.3
Wilsonville† Alaska.				4.68	Fulton t	78	27	53.6	8.5
Killisnoo † 1	51	10	30.8	9.80	Fulton †				7.8 4.3
Metlakahtla †	53	9	36.1	9.70	Harrison †	73	23	45.5	2.2
Arizona.	00	_	3.	' '	: Bélenáa f		-3	43.3	7.0
Antelope Valley†				0.00	Helenab†	76	28	51.6	6.3
Ariz. Can. Co.Dam.†		34 38	61.6	0.00	Hope * † 1	77	32	51.7	8.2
Benson *1	78	35	56-1	0.00	Hot Springs	78	24	49.6	7.7
Bisbee†¹	75* 76°	36 33°	52.2 53.4°	0. 29 T.	Keesees Ferry*†¹. Kirby†. Lonoke*¹. Madding ².	72 70	24 28	45.8	2 · I II · O
Casa Grande *1	78	40	62.4	0.00	Lonoke *1	74	30	50·9 53·5	5.8
Chiricahua Mts†				1.87	Madding 2	l.'.'		49.7	7.3
Dos Cabezos • † ¹	68	36	50.6	0.00	Malvern† Melbourne†	68	28	48.8	7.9
Dragoon Summit * 5	63	40	52.2	0.23	Melbournet	73	23	45.9	4.6
Dudleyville † 1	80	34	54.4	0.10	Mount Nebo † New Gascony*1 Newport a †	73	26	45.5	2.6
Eagle Pass • 3	70	33	46.0	0.40	New Gascony *1	75	32	51 9	7-8
Farleys Camp 2	82		53.9	0.00	Newports+	70			8.4
Florence† Fort Apache	82 71	34 21	58.9 45.6	0.57	Newport b† Osceola † 1	70 74	24 26	49.4	7.6 6.0
Fort Bowie	70	32	51.4	0.30	Ozark †	77	28	48.3 50.0	2. I
Fort Grant	77	35	54.1	0.12	Pine Bluff†	78	29	53.4	9.8
Fort Huachuca	77	33	53.6	T.	Prescott † Rogers †	72	31	52.6	9.8
Fort Mohave†	90	30	59.8	0.00	Rogers t	68	20	43.2	

Meteorological record of voluntary observers, &c.—Continued.

	Stations.	Temperature. (Fahrenheit.)			p'n.	Stations.	Temperature. (Fahrenheit.)			p'n,
		Max.	Min.	Mean	Precip'n.		Max.	Min.	Mean	Preci
	Arkansas-Cont'd.	۰	0	•	Ins.	California—Cont'd.	0		0	Ins.
	Russellville†	72	22	49.7	3.73	Evergreen				3.98
١,	Searcy † 1	72	23	47.8	11.74	Exeter *1 Fall Brook *1 Farmington *1	84	33	57 · 5	0.37
١,	Stuttgart † Texarkana †	77	30	51.2	7·23 5·88	Fall Brook *1	90 89	35	57.2	2.85
	Warm Springs	76	32	54.6	2.35	Felton * !	88	32 24	58.0 53.6	2.38 7.11
	Washington b*1 Winslow * † 1	77	32	51.6	8.25	Fernando *1 Florence *1	84	40	59· I	1.48
	Winslow*†1	61	25	43.5	1.78	Florence*1	82	48	62.5	2.99
:	California.	84	20	53.2	3.61	Florin * 4 Folsom City a* 1 Folsom City b	83 80	29	54.9	4.61
:	Agnew 1	79	30 31	57.7	1.32	Folsom City b		42	57.2	5.41 6.82
	Alvarado† Anaheim *1 Antioch *1	90	32	56.7	4.55	Forestville †	78 r	30 f	53.2f	
i	Anaheim *1	88	43	61.3	0.94	Bort Bidwell	ÓÒ	18	40. I	3.12
1	Aptos*1	82 80	40	56.8	4·52 3·66	Fruto *1	70 86	39	56.6	0.51
1	Arcata		30	53.0	8.51	Fresno *1 Fruto *1 Galt *1 Georgetown† Gilroy *1	78	35 33	57.8 56.0	5.80 5.37
	Arcata Arlington Heights.	90	35	62.8	0.09	Georgetown†	76	28	52.4	13.31
١,	Atmone*1	75	30	52· I	1.58	Gilroy *1	82	30	54.7	5.40
	Auburn*1Bakersfielda*1	80 80	35 36	58.0 58.0	6.13 0.55		70	30	44.3	0.34
1	Bakersfield b †	83	21	53.2	0.40	Glendora Glen Ellen*1 Goshen*1		31	55. I	3.13 9.79
	Bakersfield b† Ballast Point L. H.				0.80	Goshen • 1	83 88	30	55.1	0.65
i	Beaumont *1	83	40	63.4	1.65	Grass Valley a				13.44 12.88
	Belmont*1 Berendo *1	82 80	37	58.5 56.2	0.00	Grass Valley b Haywards * 1	70	26	46.0 51.8	3.00
,	Berkelev	74	35 39	55.4	5.35	Hollister *1	86	35 26	51.5	2.82
	Bishop Creek *1	75	18	51.1	1.42	Hornbrook • 1	65	22	42.3	2.65
۱ ۱	Boca *1	65	3 28	29.7	8.35	, gumbotat L. H		•••••		5.71
	Bishop Creek*1 Boca*1. Borden*1. Boulder Creek*1	82 82	28	55·7 52·1	0.33	Huron *1 Hyde Ranch	80	35	60.4	0.60 5.42
;	Brentwood *1	78	32	55-3	2.83	Hydesville† Independence α†	74	31	49· ó	8.00
	Brighton *1 Byron *1	77	35	58-5	4.42	Independence a†		19	51.2	0.23
. 1	Caliente * I	78 80	28 35	55.6	3.21	Indio *1	92 76	40 30	64.7	4.03
, 1	Calistoga *1	84	30	57.0	S.or	Indio *1 Ione *1 Iowa Hill *1 Jackson	79	30	54·5 53·3	8.21
:	C. Mendocino L. H.				3.80	Jackson	78	30	52.0	7.48
	Capitola • 1	80 So		55-4	2.71	0.01011	78d			6.40
	Centerville *1	82	37	56.2 57.4	3.49	Julian† Keeler *1	71	32 <sup>d</sup> 32	54·4 <sup>d</sup> 52·2	0.11
	Chico *1	88	32	58.5	6.31	Keene *1 Kennedy Gold Mine *1 King City *1	73	32	50.9	0.65
1	Chino	85	32		1.95	Kennedy Gold				
	Citeus	62 76	14 20	37.6 52.9	12.60 0.00	King City *1	77 80	30 20	51.9 62.2	7·38 2·78
1	Claremont f			32.9	2.92	King City *1 Kingsburg * 1	75	30	55.0	0.33
,	Cloverdale					Knights Landing#1	8.4	38	58.1	5.38
, ļ	Collax • 1	80 86	30	49.7	1.55	Lagrange • 6	83 80	35	57.6	5.46
:	Colton *1 Corning *1	80	32 26	55.3	9.07	Laurel *1	86	30 30	53.0 58.0	9.60
Ì	Crescent City				11.66	Lagrange • 6 Lathrop * 1 Laurel * 1 Lemoore * 1	78	30	54.5	0.23
•	Crescent City Crescent City L. H.				9.90	Lime Point L H				3.20
	Crofton *1 Davisville a*1	84 80	37	60.8	0.54 2.78	Livermore * 1	80 82	33	55.2	4.97
1	Davisvilleb	83	29 30	56.0 58.4	4.12	Logi	77	35 32	59.0 54.4	3·07 5·47
5	Delano *1 Delta *1	75	40	57.8	0.35	Long Beach *1	85	34	57.8	
,	Delta *1	80	30	52.3	13.08	Los Angeles *1	86	41	59.0	4.12
	Downey *1 Drytown	96 77	42 31	54.2	2.90 8.17	Los Banos *1 Los Gatos a*1	73 79	32 33	52.9 53. I	9.24
	Duarte 1	90	42	61.2	2.91	Los Gatos b Mammoth Tank*1.	74	35	53.0	13.71
3	Duarte 1 Dunnigan • 1	82	24	57.0	6.92	Mammoth Tank *1.		40	64.4	0.00
1	Dunsmuir*1 East Brother L. H.	70	25	45.7	7·47 1·58	Mare Island L.H Martinez • 1	78	38	F2 C	4.61
	Edmonton				23.00	Marysville a*1	83	32	53·9 56·9	5-55 6-90
,	El Casco *1	85	35	58.6	0.00	Marysville a*1 Menlo Park *1 Merced *1	7Š	38	54.6	4.69
,	Eldorado *1	18	31	49.4	7.80	Merced *1	80	36	56.5	0.64
•	El Casco *1. Eldorado *1. Elmira •1. El Verano *1.	84 81	32 32	53.4	5.86	Milton (pear) *4	75	35	54.6	15.64 5.33
;	Emigrant Gap *1	59	13	41.3	15.02	Modesto a*1	86	35 41	58.6	2.69
3	Emigrant Gap *1 Esparto • 1	85	38	59.9	8.01	Middletown Milton (near) *4 Modesto a*1 Mohave*1	79	28	54.7	0.27